We Claim:

Sub A2

A method of synchronizing mobile radio receivers in a mobile radio system, wherein a first synchronization channel with a first frequency is provided for transmitting a signal with a code that is known to the mobile radio receivers and to base stations of the mobile radio system, and wherein a transmission from a base station to a mobile radio receiver delays the signal by an unknown time period and the first frequency is shifted by the transmission to a second frequency, the method which comprises the following steps:

splitting a received signal into a real part signal and an imaginary part signal;

sampling the real part signal and the imaginary part signal to form sampled signals;

digitally filtering each sampled signal to correlate the sampled signal to the known code and to form filtered signals;

squaring each filtered signal to form squared signals;

determining a maximum signal level from the squared signals;

estimating the unknown time period with the maximum signal level determined in the determining step;

despreading the received signal with the known code and taking into account the time period estimated in the estimating step; and

fine-tuning the second frequency to the first frequency.

2. The method according to claim 1, wherein the filtering step comprises delaying the sampled values of each signal by up to (2K+1) clock cycles, where K is a number of coefficients of a digital filter executing the filtering step.

3. The method according to claim 2, which comprises multiplying the differently delayed sampled values by 2(K+1) coefficients and then summing.

4. The method according to claim 3, wherein the 2(K+1) coefficients have (K+1) pairs of identical coefficients.

5. The method according to claim 1, which comprises defining the code to be transmitted with the signal to have a sequence of 256 chips uniquely characterizing the first synchronization channel.

6. The method according to claim 5, which comprises sampling each signal obtained by splitting with a sampling rate wherein two sampled values are taken per chip of the code.

A device for synchronizing mobile radio receivers in a mobile radio system having a first synchronization channel for transmitting a signal with a code that is known to all the mobile radio receivers and to all base stations of the mobile radio system, comprising:

input signal processing units in a mobile radio receiver for processing a received signal including a real part signal and an imaginary part signal;

said input signal processing units generating sampled values;

a plurality of delay circuits connected in series with said input signal processing units for receiving an input signal and outputting an output signal, said delay circuits receiving the sampled values and correlating the real part signal and the imaginary part signal with the known code;

multipliers connected to receive the input signal and the output signal of each delay circuit and multiplying a supplied signal with a coefficient;

first adders connected to receive an output signal from each said multiplier and each outputting a summed signal;

squaring elements each having an input connected to receive the summed signal from a respective said first adder and outputting a squared signal; and

a second adder connected to receive the squared signals from said squaring elements.

8. The device according to claim 7, wherein each said input signal processing unit has an analog low-pass filter, a sampler, and a memory.

9. The device according to claim 7, wherein a number of different coefficients is (K+1).

10. The device according to claim 9, wherein 2(K+1) multipliers are provided, and two multipliers in each case multiply signals received thereby by one of the (K+1) different coefficients.

11. The device according to claim 10, wherein in each case two multipliers are connected to multiply one of the input signal and the output signal of one of said delay circuits by one of the (K+1) different coefficients.